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SERVICE STATISTICS

A model survey of computer services

Note by the Secretariat**

SUMMARY

At its twenty-fifth session, the Statistical Commission noted the valuable contribution of the Voorburg Group on Service Statistics and invited the Group to prepare a report on a substantive topic. The present document is their response. It describes a model survey designed for the collection of data on computer services. It is organized as follows: after a brief introduction, section I sets out the objectives and scope of the proposed survey. Section II contains the elements required to design a survey questionnaire. Section III explains the data collection system. Points for discussion are suggested in paragraph 63.

* E/CN.3/1991/1 and Corr.1.

** Prepared by the Voorburg Group on Service Statistics.

READY

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INTRODUCTION

1. The Voorburg Group on Service Statistics has contributed to the development of the Central Product Classification (CPC) by producing a classification of services as commodities for many of the service industries of the International Standard Industrial Classification of All Economic Activities (ISIC). The work of the Group has been incorporated into the version of the CPC that was presented to the Statistical Commission at its twenty-fifth session in February 1989 (ST/ESA/STAT/SER.M/77 and Add.1).

2. Subsequently, the Voorburg Group was asked to contribute a paper to the Commission at its twenty-sixth session, with the understanding that such a paper was a natural outcome of the Group's deliberations and at the same time furthered the understanding and international comparability of statistics on the service sector. 1/

3. At its 4th meeting, held in Ottawa in 1989, the Voorburg Group decided that in reply to the United Nations request, it would prepare a proposal for a model survey to be taken by a group of countries.

4. The present report, prepared by Statistics Canada and approved by the Voorburg Group at its 5th meeting (Paris, 1-5 October 1990) presents a proposal for a model survey of computer services.

5. The model is in the form of 11 modules for the collection of data about computer services; it is designed to test the product classes of the CPC and the industry classes of ISIC and to provide performance measures of the computer services industries. Two papers, containing definitions of the product classes used in module 1 and an explanation of the relationship between the classes of the model survey and the CPC, as approved by the Voorburg Group, will be made available, in their original languages, to Committee members.

I. OBJECTIVES AND SCOPE OF THE SURVEY

6. The objectives of the survey are to measure the following aggregates:

(a) The value of gross and net output originating from the computer services industries;

(b) The exports of goods and services originating from the computer services industries;

(c) The output and exports of computer services produced by other industries;

(d) The imports of computer services;

(e) Employment and fixed capital formation in the computer services industry.

It also gathers information on:

(a) The distribution and country of origin of software;

(b) Expenditure on software research and development.

7. Table 1 shows the scope of data collection proposed in the model survey of computer services.

8. The modules are not meant to be used as a single collection vehicle, since the target population is not the same for all modules and questions. Each statistical office participating in the survey will need to elaborate questionnaires and a collection strategy in line with its own survey practices and taking into account the response burden imposed on its respondents. In doing so, they may choose not to use all of the modules - or for that matter, all of the detailed questions provided in the first two modules.

9. Modules 1-6 form the core of the survey. They are designed for businesses classified under ISIC 72 - Computer and related activities. Some of the questions in those modules would also be relevant for collecting information about output and exports from businesses operating in other sectors of the economy.

10. Module 7 is designed for the collection of data relating to the imports of computer services.

11. Module 8 is designed for the collection of additional information about software revenues.

12. Modules 9 and 10 are designed for the collection of information on the number and characteristics of persons working in computer services industries and on capital formation in those industries.

13. Module 11 is designed for investigating research and development expenditures on software development and business accounting practices related to these expenditures.

14. Those countries that choose the enterprise as the unit of observation might want to include a balance sheet in order to gather information on assets and liabilities and the source and application of funds. This information is typically available for enterprises but not necessarily for more narrowly defined statistical units. Such an approach would provide a broader set of integrated data to analyse the performance of the computer services sector. Other data items which could be collected if the enterprises is used as the unit of observation are discussed in section III.

Table 1. Scope of data collection proposed in the model survey

Module	Topic
1	Revenues from the sale of goods and services
	1.1 Revenues from the sale of computer services
	1.2 Revenues from the sale of computer-related goods and services
	1.3 Revenues from other sources
2	Goods and services used in the operations
3	Purchases of goods and services for resale
4	Inventories
5	Supplementary questions concerning the basis of accounting
6	Exports
	6.1 Computer services
	6.2 Computer-related goods and services
7	Imports
	7.1 Computer services
	7.2 Computer-related goods and services
8	Supplementary questions regarding packaged software products revenues
9	Employment
10	Fixed assets, additions and disposals
11	Software research and development

II. THE MODEL SURVEY

15. The model survey is presented in the form of data collection modules. The classes of the CPC have been expanded and regrouped for inclusion in the survey. The data collection modules are as follows:

MODULE 1. REVENUES FROM THE SALE OF GOODS AND SERVICES

This module is concerned with the revenues generated by this organization from the sale of goods and services both to the domestic and the export market. For the purpose of this survey, transactions with related parties (sales at market prices or transfers at internal prices) should be included. Please exclude from the amounts reported any taxes collected by this organization on behalf of the Government.

1.1. Revenues from the provision of computer services

		Value
A.	PACKAGED SOFTWARE PRODUCTS (OF OWN DESIGN)	
	(a) Systems and user tools software	_____
	(b) Application software	_____
B.	PROFESSIONAL COMPUTER SERVICES	
	(a) Consultancy services related to the installation of hardware	_____
	(b) Systems and technical consulting services	_____
	(c) Custom software development services	_____
	(d) Systems analysis and programming services	_____
	(e) Computer facilities management services	_____
	(f) Systems maintenance services	_____
	(g) Other professional computer services	_____
C.	COMPUTER PROCESSING SERVICES	
	(a) Data processing and tabulation services	_____
	(b) Data entry services	_____
	(c) Other computer processing services	_____
D.	DATA BASE SERVICES (Electronic information services)	_____
E.	COMPUTER REPAIR AND MAINTENANCE SERVICES	_____
F.	OTHER COMPUTER SERVICES (please specify _____)	_____
TOTAL - COMPUTER SERVICES (A-F)		_____

1.2. Revenues from the sale of computer-related goods and services

	Value
G. PACKAGED SOFTWARE (RESOLD)	_____
H. COMPUTER HARDWARE SALES (RESOLD)	_____
I. COMPUTER SERVICES (RESOLD)	_____
J. COMPUTER HARDWARE LEASING AND/OR RENTAL SERVICES	_____
K. NETWORK SERVICES	_____
L. COMPUTER-RELATED TRAINING SERVICES	_____
TOTAL - COMPUTER-RELATED GOODS AND SERVICES (G-L)	_____

1.3. Revenues from other sources

M. ROYALTIES AND PATENT FEES RECEIVED	_____
N. SERVICES TO RELATED PARTIES NOT INCLUDED ABOVE (RESEARCH AND DEVELOPMENT CHARGES, MANAGEMENT FEES, ETC.)	_____
O. OTHER GOODS AND SERVICES (please specify _____)	_____
TOTAL - REVENUES FROM OTHER SOURCES (M-O)	_____
P. OPERATING SUBSIDIES	_____
GRAND TOTAL - OPERATING REVENUES (A-P)	_____

MODULE 2. GOODS AND SERVICES USED IN THE OPERATIONS

This module is concerned with the expenses incurred by this organization for goods and services used in the regular conduct of its business. Purchases of goods and services for resale without major modifications (e.g., purchases of software and hardware by systems integrators and value-added resellers) should be reported in module 3. For the purpose of this survey, transactions with related parties (purchases at market prices or transfers at internal prices) should be included. Please exclude capital expenditures and income taxes.

		Value
A.	WAGES, SALARIES AND EMPLOYEE BENEFITS	_____
	(a) Wages and salaries	_____
	(b) Employee benefits	_____
B.	BUSINESS SERVICES	_____
	(a) Computer services for own use (CPC 84)	_____
	(b) Professional services - legal, auditing, management consulting, etc. (CPC 86)	_____
	(c) Advertising and sales promotion (CPC 871)	_____
	(d) Insurance (CPC 812)	_____
C.	RENTAL AND LEASING OF MACHINERY (CPC 83)	_____
D.	TELECOMMUNICATION SERVICES (CPC 752)	_____
E.	MATERIALS AND SUPPLIES FOR OWN USE	_____
	(a) Operating supplies	_____
	(b) Office and other supplies	_____
F.	OCCUPANCY COSTS	_____
	(a) Rental and leasing of land and buildings (CPC 82)	_____
	(b) Utilities (CPC 17)	_____
G.	PROPERTY AND OTHER NON-COMMODITY INDIRECT TAXES	_____
	(a) Property and school taxes	_____
	(b) Permits, licences and other non-commodity indirect taxes	_____
H.	ROYALTIES AND PATENT FEES PAID	_____
I.	SERVICES FROM RELATED PARTIES (not included above)	_____
J.	DEPRECIATION	_____
K.	OTHER OPERATING, ADMINISTRATIVE AND GENERAL EXPENSES (please specify _____)	_____
TOTAL - CURRENT OPERATING, ADMINISTRATIVE AND GENERAL EXPENSES (A-K)		_____

MODULE 3. PURCHASES OF GOODS AND SERVICES FOR RESALE

This module is concerned with purchases of goods and services made by this organization and which have been resold to its clients without major modifications.

		Value
A.	Computer hardware	_____
B.	Packaged software products	_____
C.	Computer services (e.g., subcontracting computer professional or processing services, computer repair and maintenance services, etc.)	_____
D.	Other goods and services (please specify _____)	_____
TOTAL - GOODS AND SERVICES FOR RESALE (A-D)		_____

MODULE 4. INVENTORIES

This module is concerned with the change in the level of the various types of inventories held by your organization during the period covered by this report.

		Opening	Closing
(a)	Goods purchased for resale	_____	_____
(b)	Goods purchased for use in the operation	_____	_____
(c)	Other inventories	_____	_____

MODULE 5. SUPPLEMENTARY QUESTION CONCERNING THE BASIS OF ACCOUNTING

This module is concerned with the accounting method used in reporting revenues.

A. Did you report revenues (module 1) on an accrual or cash basis?

Accrual basis ____ Cash basis ____ please go to next question

B. If you were unable to report revenues (module 1) on an accrual basis, please provide an estimate of

		Opening	Closing
(a)	Value of work in progress	_____	_____
(b)	Value of accounts receivable	_____	_____

MODULE 6. EXPORTS

This module is concerned with exports of goods and services. If this organization has foreign clients, please provide an estimate of the proportion of total sales to non-residents for each of the following products. Sales or transfers to foreign related parties should be included.

		Percentage of revenues declared in module 1	or	Value
COMPUTER SERVICES				
A.	Packaged software products (of own design)	_____		_____
B.	Professional computer services	_____		_____
C.	Computer processing services	_____		_____
D.	Data base services (Electronic information services)	_____		_____
E.	Computer repair and maintenance services	_____		_____
F.	Other computer services	_____		_____
COMPUTER-RELATED GOODS AND SERVICES				
G.	Packaged software (resold)	_____		_____
H.	Computer hardware (resold)	_____		_____
I.	Computer hardware rental and/or leasing services	_____		_____
J.	Services to related parties not included above (research and development charges, management fees, etc.)	_____		_____
K.	Other goods and services (please specify _____)	_____		_____
TOTAL EXPORTS (A-K)				_____

MODULE 7. IMPORTS

This module is concerned with imports of computer-related goods and services. If this organization has directly imported goods and services from foreign suppliers, please provide an estimate of the purchase value of the following imported goods and services.

		Value
COMPUTER SERVICES		
A.	Packaged software products	_____
B.	Professional computer services	_____
C.	Computer processing services	_____
D.	Data base services (Electronic information services)	_____
E.	Computer repair and maintenance services	_____
F.	Other computer services	_____
COMPUTER-RELATED GOODS AND SERVICES		
G.	Computer hardware rental and/or leasing services	_____
H.	Services from related parties not included above (research and development charges, management fees, etc.)	_____
I.	Other goods and services (please specify _____)	_____
TOTAL IMPORTS (A-I)		_____

MODULE 8. SUPPLEMENTARY QUESTIONS REGARDING PACKAGED SOFTWARE PRODUCTS REVENUES

If your organization has generated revenues from the sale of packaged software products (module 1, sum of responses to questions A and G), this module requests supplementary information on the origin and type of packaged software distributed.

A. Please provide an estimate of the proportion of revenues (module 1, sum of A and G) derived from the sale of packaged software developed by

	Percentage of revenues declared in module 1	or	Value
(a) The organization covered by this report	_____		_____
(b) A domestic third party	_____		_____
(c) A foreign third party	_____		_____
(d) A domestic related party	_____		_____
(e) A foreign related party	_____		_____
TOTAL	100		_____

B. Please provide an estimate of the proportion of revenues (module 1, sum of A and G) derived from the sale of

	Percentage of revenues declared in module 1	or	Value
(a) Mini and mainframe software	_____		_____
(b) Microcomputer software	_____		_____
(c) Communication and other software not specified to (a) or (b)	_____		_____
TOTAL	100		_____

MODULE 9. EMPLOYMENT

This module is concerned with the number of persons employed.

	Males		Females	
	Computing a/	Other	Computing a/	Other
Working proprietors and partners:				
full time				
part time b/				
Paid employees:				
full time				
part time b/				
TOTAL				

a/ Including computing professionals (RISCO 2130), computer services managers (RISCO 1227), computing and related equipment operators (RISCO 3121 and 3122) and data-entry operators (RISCO 4113).

b/ No definition of part time is provided since it differs among countries. Each country should define part time according to its own conventions.

MODULE 10. FIXED ASSETS, ADDITIONS AND DISPOSALS

Include all fixed assets shown on your book of accounts and all assets operated by your business under finance lease arrangements. Exclude expenditures on maintenance and on intangible assets such as goodwill.

	Addition during the year	Disposal during the year	Book value at the end of the year
Land	_____	_____	_____
Building: residential	_____	_____	_____
non-residential	_____	_____	_____
Other construction	_____	_____	_____
Motor vehicles and other transport equipment	_____	_____	_____
Furniture and fittings	_____	_____	_____
Computer equipment	_____	_____	_____
Other plant, machinery and equipment	_____	_____	_____
All other fixed assets (specify main additions during the year)	_____	_____	_____

MODULE 11. SOFTWARE RESEARCH AND DEVELOPMENT

The information requested in this module should also have been reported in modules 2 and 10.

A. Has this organization been involved, in the period covered by this report, in software research and development?

YES _____. Go to B NO _____. Go to the end of this module

B. Please estimate the following categories of expenditure for the performance of software research and development within this company in this country in 199__.

	Value
Current expenditure on software research and development	
(a) Salaries and wages (incl. fringe benefits of persons engaged in research and development)	_____
(b) Other current costs (incl. contracts for services required to carry research and development but excl. contracts for research and development work. Excl. capital depreciation)	_____
TOTAL	_____
Capital expenditure on software research and development	
(a) Land	_____
(b) Buildings	_____
(c) Equipment	_____
TOTAL	_____
TOTAL EXPENDITURE ON SOFTWARE RESEARCH AND DEVELOPMENT	_____

C. In its financial accounts does this organization normally capitalize or expense the software development expenditures reported as current expenditure above?

	Capitalized	Expensed
Wages, salaries and benefits	_____	_____
Research and development contracts (subcontracting)	_____	_____
Other purchases of goods and services	_____	_____

III. EXPLANATION OF THE DATA COLLECTION SYSTEM

16. The paragraphs below discuss the purpose of the modules, the universe to which they apply, possible measurement problems, and the implications of the choice of the statistical unit or unit of observation. The discussion is followed by a scheme that presents the conceptual framework of the modules in terms of national accounts concepts.

A. Module 1. Revenues from the sale of goods and services

17. The purpose of module 1 is to measure the outputs, in current value, of business units classified in any of the computer services industries (ISIC 7210-7290). It is organized in three sections: section 1 covers the primary outputs, and sections 2 and 3 deal with the industries' most likely secondary products or sources of revenue, thereby allowing the calculation of specialization ratios necessary to determine the existence of industries (4-digit). If the questions of section 1 are also addressed to important secondary producers, it becomes possible to estimate coverage ratios, the missing element. This information would allow statistical agencies to test the applicability of the relevant ISIC classes.

1.1: Revenues from the provision of computer services

18. The intent of the questions in section 1 is to measure the outputs of computer services in current value, by the computer services industries (ISIC 7210-7290). The classes of the CPC have been regrouped into the following categories: 2/

(a) Packaged software products (of own design);

(b) Professional computer services;

(c) Computer processing services;

(d) Data base services (Electronic information services);

(e) Computer repair and maintenance services;

(f) Other computer services.

19. The main reasons for this regrouping of the CPC are:

(a) To account explicitly for the production (development) and distribution of packaged software products not currently isolated in the ISIC (part of 7220), the CPC (part of 84210) or the HS (part of 85.24);

(b) To be more in line with the approach adopted by the industry. The distinction between packaged software products, professional computer services and computer processing services, in particular, has general acceptance;

(c) To group products which are generally priced on a similar basis and therefore to facilitate future compilation of price statistics. For instance, packaged software products have a unit price; professional computer services are often charged on a per diem basis and the level of expertise of the people involved is typically the main price determinant; computer processing services are often priced on the basis of equipment utilization; and data base services (electronic information services) are usually priced on the basis of connect time, type of service accessed and period of the day it is accessed.

1.2: Revenues from the sale of computer-related goods and services

20. The intent of section 2 of module 1 is to measure the most important secondary outputs of businesses classified in the computer services industries. The rationale for, and issues raised by, some of the questions in the section are discussed below.

21. The hardware sale category is included to measure sales or commissions on sales of hardware by so-called systems integrators. 3/ These businesses offer total solutions to information processing needs. They typically perform a number of activities, including needs analysis, the development of system specifications, procurement assistance or sale of system components, custom software design and development, assistance during the implementation phase in the form of testing and tuning, preparation of systems documentation and training of users etc., or manage those who perform such activities. A number of issues arise regarding systems integrators:

(a) How should their output be defined?

(b) In which ISIC category should they be classified?

(c) How should their output be measured?

22. The output of systems integrators can either be defined as a combination of distinct goods and services - computer hardware, computer software and professional computer services - or as a bundle of goods and services. The former approach is suggested here. If the latter approach is adopted, a system integration service category would have to be defined and introduced in the survey.

23. The current CPC is not explicit about the classification of systems integrators' output. Perhaps CPC 84100 (Consultancy services related to the installation of hardware) was intended for this purpose. However, a different interpretation of this product category has been made here (see definition in annex 1).

24. The ISIC is also unclear about the classification of systems integrators. There are two apparent possibilities:

(a) They should be classified in ISIC 7210 (Hardware consultancy), which is the approach suggested here. If this approach is supported, a clarification of this ISIC definition should be sought. At a minimum, this definition should mention the three basic components of a typical systems integration contract mentioned above;

(b) They should be classified on the basis of their primary activity, either the wholesaling of computer hardware and software (ISIC 5150) or the provision of computer services (ISIC 7210).

25. The choice of questions to measure the output(s) of systems integrators is a function of the definition of their output (combination versus bundle of goods and services). The decision concerning the approach to assign an industry code to these businesses can also influence this choice; if the classification is based on the primary activity, it becomes necessary to obtain information on the component parts of system integration contracts.

26. The network services category is included to account for network-based services such as Electronic Data Interchange (EDI), Electronic Mail (E-mail) and videotex services (computerized home shopping, home banking etc.) which are sometimes offered by businesses primarily engaged in the provision of computer processing services and/or in data base (electronic information) services. In Canada these services are treated as communication services rather than as computer services. 4/

27. The purpose of the operating subsidies category is to respect the principles of economic accounting used in the valuation of industries' gross output. However, not all countries may wish to use the question, for the following reasons:

(a) Subsidies are not an important source of income for the industry;

(b) The question may be pertinent in some countries and not in others;

(c) There are other and more efficient ways of obtaining this information.

28. The main purpose of the question concerning services to related parties is to capture revenues earned by domestic business units by charging their foreign affiliates fees for research and development services, management services etc. The pertinence of this question may very well vary by country. It is especially interesting for those which are the home base for multinational enterprises operating in the computer services sector.

29. Module 1 contains the core information needed to measure the gross output of computer services industries. The missing information will be reviewed below in the discussions concerning modules 4 and 5.

30. In order to obtain information on the total production of computer services, some of the questions in module 1 should be addressed to business units classified in industries other than ISIC 72 (Computer and related activities). For example:

(a) Our research shows that accounting firms (ISIC 7412) and management consulting firms (ISIC 7414) are becoming important producers of computer consulting services;

(b) A significant portion of the packaged software products is distributed not by those primarily engaged in designing and developing such products, but rather by wholesalers, retailers and computer equipment manufacturers (ISIC 5150, 5239 and 3000, respectively).

It is difficult to suggest which specific industries should be targeted for the measurement of the secondary production of computer services. The choice of other industries requires a good knowledge of the country's organization of production, a matter best handled by national statisticians.

B. Module 2. Goods and services used in the operations, and Module 3. Purchases of goods and services for resale

31. The purpose of modules 2 and 3 is to obtain information on the cost structure of surveyed business units. This information, along with that of modules 1, 4 and 5, allows the calculation of value-added at factor cost 5/ originating from the computer services industries and also provides for an estimate of its major components - namely, wages, salaries and supplementary labour income; and gross and net operating surplus.

32. The questions in module 2 cover costs of production. The choice of categories was influenced by the following criteria:

(a) The expenses had to be significant for the targeted population. Countries may wish to combine some categories and elaborate on others. For example, they may wish to combine salaries and wages with employee benefits or to isolate, from the residual category, fuel oil, gasoline and automobile repair costs and any other categories they consider important;

(b) It had to meet the minimum requirements to calculate value-added. (These were set out in the Industrial Statistics Production Model, developed in Statistics Canada and distributed at the fourth meeting of the Voorburg Group.)

33. Property and school taxes (category G.a) and permits and licences (category G.b) of module 2 are included as examples of non-commodity indirect taxes. 6/ The data are necessary in order to calculate, by the residual method, value-added at factor cost. Each country adopting this survey would have to take into account its own taxation practices to determine which are the relevant questions.

34. Module 3 primarily targets systems integrators. As stated above, this type of business is often engaged in trading computer hardware and packaged software products. The information on the purchase value of these products (module 3) along with the information on their sale (module 1) allows the calculation of trade margins.

C. Module 4. Inventories

35. The purpose of module 4 is to collect information which permits the calculation of and intermediate inputs for services producing industries in a manner consistent with that used for goods producing industries. It presupposes that information relating to costs has been collected as materials and services purchased rather than goods and services used.

36. The first question in module 4 (inventories of goods purchased for resale) is addressed to business units engaged in the trading of computer hardware and packaged software in order to adjust purchases of goods for resale for changes in the level of inventories. The actual business practices of the targeted population may, however, make this question rather marginal. The units targeted by this question are, again, systems integrators. Since these businesses essentially "tailor" computer systems to meet the particular needs of each client, it is probably more efficient for them to acquire the necessary products on a need basis than to maintain inventories. A study of systems integrators' practices with regard to inventories could shed light on this issue.

D. Module 5. Supplementary questions concerning the basis of accounting

37. The purpose of module 5 is to collect the information necessary to value correctly the production of service outputs when transactions/revenues are reported on a cash basis. This is especially important for some consulting services, including professional computer services, since their production can require an extended period of time. In those cases, the period in which transactions (payments) are recorded may not reflect the period in which the services were produced.

38. Module 5 is organized in a manner similar to that of a typical module on inventories. It asks for particular values at the opening and closing of the accounting period. The questions address the issues of:

(a) Progress payments. Some service contracts include provisions for payments after completion of particular phases of the project. These payments can be used as a proxy for the value of production, in a given period, of a project which is not yet completed;

(b) Accounts receivable. This item allows the measurement of the value of services which have been delivered during the accounting period but for which no payment has been received.

39. The above questions are not needed if respondents report revenues on an accrual basis of accounting.

E. Module 6. Exports, and Module 7. Imports

40. The purpose of these modules is to measure international trade in computer services.

41. The classifications used in the export and import modules are consistent with, although not as detailed as, the classifications used in module 1. The choice of aggregate, rather than detailed, categories follows the usual practice where trade classifications are not as elaborate as those used for production statistics. This does not preclude the use of a more detailed or aggregated classification. The choice should be based on the relative importance of trade in the various services and on the capacity of respondents to supply the requested information. However, since the object of this survey is to produce internationally comparable data, it would be preferable to use either standard classes (most detailed level) or aggregates consistent with the classes or aggregates used to measure production.

42. Many of the issues that arise in measuring the import and export of computer services are a consequence of the different modes of delivery of these services. These can be:

(a) Delivery by the employees of a domestic enterprise by travelling to a foreign country (e.g., professional computer services, computer repair and maintenance services and computer-related training services);

(b) Shipped across the border embodied in a physical medium - e.g., diskettes, tapes, books. The most obvious examples are packaged and custom software; 7/

(c) Delivery through public or private telecommunication networks. Computer processing services and data base services are the best examples.

43. The main issues with regard to packaged or custom software shipped across the border are:

(a) The Harmonized System, the customs classification, does not isolate software as a traded product but rather categorizes the medium. There would therefore be a need to amend the Harmonized System if customs documents are to be used to gather information on trade in software;

(b) The valuation at the border, especially in the case of custom software, is very often that of the medium rather than the product. Because this problem will continue to exist even after changes to the Harmonized System, it may be preferable to obtain this information by addressing questions directly to importers and exporters.

44. The import or export value of computer services delivered through public telecommunication networks can be difficult to measure owing to the fact that the provision of such services can involve more than one enterprise - that is, the computer service firm and one or many telecommunication carriers. The measurement

difficulty can best be explained with the following example: an individual or a business subscribes to a telecommunication carrier's "gateway" service 4/ to gain access to a number of data bases, some of which are foreign. The client extracts data from a foreign source; therefore, an import of services should be recorded. The individual - the importer - transacts with a domestic enterprise, the telecommunication carrier, which acts as a broker. The bill received includes both the telecommunication charge (which itself can include an imported element) and a charge for the use of the data base service. This part of the bill is remitted, less a collection charge, to the foreign data base vendor by the telecommunication carrier. Although the individual is the importer, the telecommunication carrier is likely the best source to obtain information on imports of data base services in these instances. In the absence of "integrated billing", the importer (in this case the business or individual accessing the foreign data base) would be the best source of the information.

45. The target population for each of the two modules is different. The target population for the export module includes businesses classified to ISIC 72 (Computer and related activities) and important secondary producers. (When domestic-based multinational enterprises are addressed by these questions, they need to be instructed not to include sales by foreign subsidiaries in exports.)

46. The target population for the import module includes all businesses and institutions and, in the case of some services (in particular, software products and data base services), it also includes individuals. The size and diversity of the target population makes the elaboration of a collection strategy for import data a difficult task.

47. There are, however, some alternatives to surveying the entire potential universe of importers for certain types of services, provided some assumptions are made. For example:

(a) The value of imports of packaged software can be obtained through a survey of software distributors (wholesalers, retailers, developers, hardware manufacturers and distributors etc.). The necessary assumption here is that most imported software bought in the country is distributed through those channels;

(b) The value of imported data base services could perhaps be estimated from information provided by telecommunication carriers. This information could consist of total billings, traffic for gateway services and an estimate of the traffic generated by data base services which does not pass through gateways. The assumption here is that telecommunications carriers are able and willing to discriminate between this type of traffic and other movements of information through their networks. This approach will not however account for data base services transacted between parent and subsidiary corporations when private networks are used. In this case, questions would have to be addressed directly to the businesses making payments or transfers to their parent companies abroad for data base services and other computer services;

(c) The target population for the question concerning payments made to related parties can be established by isolating foreign-owned enterprises operating in the computer services sector and related fields.

F. Module 8. Supplementary questions regarding packaged software products revenues

48. This module serves the following objectives:

(a) To identify the national origin (domestic or foreign) of packaged software products marketed by domestic distributors in the domestic market 8/ (question A);

(b) To provide an insight into the structure of the software product market (question A) - that is, what proportion of the market is served by domestic software developers, foreign software developers or independent distributors;

(c) To compare the size of the mini- and mainframe software market with that of the microcomputer software market and of the market of software adapted to both technologies.

49. The questions in this module can be addressed to any business unit engaged in the marketing of packaged software products. Most of these units are likely classified in one of the following ISIC categories:

(a) ISIC 72. Computer and related activities (in particular, ISIC 7220 - Software consultancy and supply);

(b) ISIC 5150. Wholesale of machinery, equipment and supply (part of);

(c) ISIC 5239. Other retail sale in specialized stores (part of);

(d) ISIC 3000. Manufacture of office, accounting and computing machinery.

G. Module 9. Employment

50. This module is designed for the collection of information about both working proprietors and partners and paid employees within the businesses. No definition of part time is provided, as the notion differs among countries. Each country should define it according to its own conventions.

51. Computer-related occupations are defined in terms of the Revised International Standard Classification of Occupations of the International Labour Office. This module is principally designed for businesses primarily engaged in the supply of computer services.

H. Module 10. Fixed assets, additions and disposals

52. This module is designed for the collection of information relating to capital formation. The objective is to collect information about investment in all types of construction and machinery and equipment by businesses primarily engaged in the supply of computer services.

I. Module 11. Software research and development 9/

53. The purpose of module 11 is to gather information on amounts spent by software developers on research and development and on their accounting practices related to those expenses. The information requested in this module ought also to have been provided in modules 1 and 10.

54. Software research and development 10/ is defined as the systematic investigation carried out in the field of software by means of experiment or analysis to achieve a scientific or commercial advance. Research is original investigation undertaken on a systematic basis to gain new knowledge. Development is the application of research findings or other scientific knowledge for the creation of a new or significantly improved product. If successful, development will usually result in a product which represents an improvement in the "state of the art" and is likely to be patentable.

55. It is recommended that for section B all outlays on this activity by the surveyed organization should be included, whether they are expensed or capitalized. A further question in C then asks the respondent whether the expenses are capitalized or not.

J. Unit of observation

56. The choice of unit of observation for this survey is best left to participating countries since they are in a position to take account of factors such as the industry profile, the structure and content of their business register, the agency's usual collection strategy etc.

57. This being said, it is probable that participants will either choose the establishment or the enterprise, the two most widely used statistical units.

58. The choice of statistical unit for the questions of modules 1-6, especially when addressed to the computer services industries, can affect the comparability of results. The main consequences are:

(a) A difference in coverage. Contrary to an enterprise-based survey, an establishment-based survey would include "commercial" establishments classified in ISIC 72 which belong to enterprises for whom the provision of computer services is a secondary activity, and establishments classified in ISIC 72 whose products are transacted within the enterprise; and would not include establishments classified outside ISIC 72 which belong to enterprises primarily engaged in providing computer services. The impact on the comparability of results will depend on the degree of specialization of enterprises operating in the computer services sector;

(b) Choosing the enterprise rather than the establishment would also have an impact on the industrial structure shown by statistics. Choosing the enterprise could result in significantly different specialization and coverage ratios if

enterprises are generally more diversified than establishments and if the production of computer services is a significant secondary activity of enterprises classified outside the computer services sector;

(c) Choosing the enterprise can also create difficulties in tabulating information on a regional basis. This problem, however, can be solved by asking enterprises to report information on a regional basis or to provide information which allows the statistical agency to make estimates.

59. If the establishment is chosen as the unit of observation, it would be necessary to develop a questionnaire (or a collection strategy) to cover the activities of ancillary units classified in the target industries. This is necessary in order to have full coverage and, by implication, to enable the measurement of value-added originating from the industry. The ancillary units of particular interest in the computer services industries are head offices and research and development units concerned with the development of software. The basis for such an inquiry could be the questions of module 2 (Goods and services used in the operations) and module 11 (Software research and development).

60. Those countries that choose the enterprise as the unit of observation might want to include a balance sheet in order to gather information on assets and liabilities and the source and application of funds. This information is typically available for enterprises, but not necessarily for more narrowly defined statistical units. Such an approach would provide a broader set of integrated data to analyse the performance of the computer services sector. Other questions which would be relevant at the enterprise level are interest and dividends paid and received, insurance claims, bad debts recovered and donations.

K. National accounts concepts and the modules

61. The schema shown below does not provide a guide to the precise reconciliation of the content of the modules to the national accounts. There are items such as interest and dividends paid and received which are not included in the modules. In addition, some of the items collected with the proposed model survey will need to be revalued to conform to SNA concepts. In particular, insurance and depreciation expenses are treated differently in business and economic accounts.

62. The survey's conceptual framework in terms of macro-economic concepts is as follows:

	Gross output at producers' prices		
	Module 1, except L (operating subsidies)		
	+ Module 4c (closing)		
	- Module 4c (opening)		
	+ Module 5B (closing)	)	
		)	optional
	- Module 5B (opening)	)	
less	Intermediate inputs at purchaser's prices		
	Module 2, except A, B, K, L and N		
	+ Module 3		
	+ Module 4, questions a & b (closing)		
	- Module 4, questions a & b (opening)		
=	GDP at factor cost		
	- Module 2, questions A & B		
=	Gross operating surplus		
	- Module 2, question N		
=	Net operating surplus		
less	Non-commodity indirect taxes		
	Module 2, questions K & L		
plus	Operating subsidies		
	Module 1, question L		

IV. POINTS FOR DISCUSSION

63. The Statistical Commission may wish to:

(a) Comment on the scope, content and methodology of the proposed survey;

(b) Suggest further follow-up action to the proposed survey;

(c) Provide guidance on possible future contributions that the Voorburg Group may make to international work on services statistics.

Notes

1/ Official Records of the Economic and Social Council, 1989, Supplement No. 3 (E/1989/21), para. 77.

2/ These groups have been tested and refined through the survey process, now in its fourth year, in Canada.

3/ This type of business is also called "value-added reseller" and "turnkey system vendor". True value-added resellers, however, act more like wholesalers in that they sell the same product (computer system) to many clients.

4/ See "Telecommunications services", the Canadian submission to the meeting of the Voorburg Group on telecommunications and value-added network services (Ottawa, 2-5 October 1989).

5/ The information necessary to measure own account capital formation, in its traditional SNA sense, is not asked here because it is assumed to be a marginal activity for the targeted population. If software is considered capital there would be a definite need to address this issue in the questionnaire. Perhaps the questions of module 11 (Software research and development) could serve the purpose of measuring this type of own account capital formation.

6/ Indirect taxes are defined as compulsory payments made by producers to government in respect of the production, sales, purchase or use of goods and services, which they charge as expenses of production. Non-commodity indirect taxes are defined as indirect taxes which cannot be identified with any particular commodity produced or sold.

7/ Custom software can be delivered like other professional computer services, by telecommunication means or simply in hardcopy by mail.

8/ One also needs to look at the information gathered in modules 1 and 6 to get the "complete picture".

9/ Those countries who currently conduct a research and development survey based on the OECD (Frascati) standards can meet the basic objectives of this module by adding the following question: please estimate the percentage of the total research and development expenditures reported for 199__ on software development.

10/ There are some important unresolved definitional, valuation, classification and measurement issues relating to the treatment of research and development and similar expenses in economic accounts. These issues are dealt with in M. C. Caplan, Intangible investment: an essay at international comparison", paper prepared for the Organisation for Economic Co-operation and Development, Directorate for Science, Technology and Industry (DSTI/IND/87.24, 22 September 1987), and Anne Harrison and Carol S. Carson, Service Output as Capital: What are the Implications? (Washington, D.C., United States Bureau of Economic Analysis, 1989).